

THE GEOPHILOIDEA OF THE FLORIDA KEYS.

By O. F. COOK.

In March, 1898, I had the opportunity of spending a few hours in collecting between Key West and Pine Key, most of the available time being spent at Sugar Loaf Key. The season was very dry, and the humus-inhabiting types of all kinds had burrowed out of reach. Of the four species of Geophiloidea secured, however, three are new, and two of these represent new genera without known relatives in the United States. The group is one so generally neglected by collectors that little can be asserted with confidence concerning the distributional limits of its members, but the available information is utilized in the appended synopses of genera.

The Geophiloidea collected on the Keys belong to three families, which may be distinguished as follows:

Antennæ clavate; anal legs very stout, subconic, the joints being mostly broader than long; cephalic and basal lamina very broad, concealing the prehensorial legs from above: Family Ballophilidæ.

Antennæ filiform; anal legs long and usually slender, the joints (except the first) distinctly longer than broad; cephalic and basal lamina not concealing the sides of the prehensorial legs..... ..

Mandibles with 1-3 dentate lamellæ in addition to the pectinate lamella; labrum entire: Family Schendylidæ.

Mandibles without dentate lamellæ; labrum 3-parted. Family Geophilidæ.

Four other families of Geophiloidea are known from North America, but have not been reported in the Gulf region. These are the Linotæniidæ, of circumpolar distribution; the Himantariidæ,* known from Mexico and California; the Dicellyphidæ,

* To this family (Himantariidæ) but a single American genus, *Chomatobius* Saussure, is at present referred. Through the kindness of Professor Kraepelin, of the Hamburg Museum, I have had the opportunity of studying a Mexican specimen which agrees closely with Saussure's description, but differs notably from the animal described by Seliwanoff from California as *Chomatobius mexicanus* Saussure. This latter evidently represents a different generic type, for which the new name *Nothobius californicus* is proposed. It is distinct from *Chomatobius* in having a row of small suprascutella, in having the ventral pores in rounded areas, the last pleuræ with numerous small pores, and the anal legs with a distinct claw, none of which characters appears in the Mexican specimen, nor in Saussure's description of *Chomatobius*. Seliwanoff's description is contained in the paper entitled "*Geophilidæ Mus. Imp. Akademii nauk*," 1881, p. 24, pl. II, figs. 9-16.

a tropical group with a Californian species, and the Oryidæ, most of which are tropical.

FAMILY SCHENDYLIDÆ.

The representatives of this family inhabit both continents, but are as yet unknown from the Malay region.

The following synopsis affords diagnosis of the genera, to which a statement of their known distribution is added. With the exception of *Pectiniunguis*, the habits of which are here recorded for the first time, the members of this family are to be found in the humus of forests or cultivated grounds.

Ventral pores wanting; anal legs provided with a normal claw; pleural pores numerous, pigmented, scattered over the ventral surface of the last pleuræ; last sternum narrow: Genus *Escaryus*, type *E. phyllophilus*,* New York.

Ventral pores present; claw of anal legs rudimentary or wanting; pleural pores few, unpigmented, opening into two large cavities which are more or less concealed by the broad last sternum.....

Anal legs 5-jointed: Genus *Nannophilus*, type *N. eximius*, Mediterranean Region.

Anal legs 6 jointed.....

* A third species of this genus, *Escaryus sibiricus*, is represented by numerous specimens collected by Graeser at Vladivostock, Siberia, now preserved in the Hamburg Museum. It is distinct from *E. phyllophilus* in the much larger size, the more attenuate antennæ, the wider cephalic lamina, the less prominent nodule of the femur of the prehensors, the very numerous and close-set pleural pores, and the minute claw of the anal legs. The sterna have a very deep median foveola, and are beset with short hairs, but are entirely without pores. The anal legs of males are crassate, strongly curved, and densely hirsute. Larger individuals measure nearly 65 mm. by 2.5 mm.; pairs of legs 49 in males, 49 or 51 in females. I have recently found, in a small collection secured by Professor T. D. A. Cockerell at Dropping Spring, Organ Mountains, New Mexico, still another member of the Schendylidæ which suggests *Escaryus* in the possession of a normal claw in the last joint of the anal leg. In other characters it approaches *Pectiniunguis*, from which it differs greatly in habit, being but about 15 millimetres in length, and having in the female 45 pairs of legs. From plate IV, figs. 4a and 4b, it will be seen that the last sternum is much broader than in *Pectiniunguis*, and that the proportions of the anal legs of the two forms are very different, in addition to the discrepancy in the matter of the claw. The new genus and species may stand as *Holitys neomexicana*.

Ventral pores arranged in two circular areas : Genus Schendylops, type *S. grandidieri*,* Madagascar.

Ventral pores arranged in a single, median, circular area

Claw of maxillary palpus simple; mandibles with a single dentate lamella; last joint of anal legs much smaller than the preceding: Genus Schendyla, type *S. nemorensis*, Europe and North America.

Claw of maxillary palpus pectinate; mandibles with three dentate lamellæ; last joint of anal legs as long or longer than the preceding.

Labial and maxillary sterna distinct; labrum free except in the middle; anal legs slender in both sexes: Genus Ctenophilus, type *C. africanus*, Liberia.

Labial and maxilla sterna coalesced in the middle; labrum entirely coalesced; anal legs crassate, especially in the male: Genus Pectiniunguis, type *P. americanus*, Lower California and Florida Keys.

PECTINIUNGUIS AMERICANUS BOLLMAN.

(Plate IV, fig. 3a).

This most common myriapod of the Keys was, until the present time, known only from a single male specimen secured by the *Albatross* in the Gulf of California, an indication of its littoral habits. On the Keys it was frequently taken under stranded rubbish of any sort which held moisture and gave sufficient protection. Specimens were more numerous on rocky than on sandy shores, and were sometimes apparently absent from the latter. On Sugar Loaf Key many specimens were secured.

The living animals are a uniform waxy brown in color, or may have two dark longitudinal bands like *Geophilus rubens* Say (*G. cephalicus* Wood). On being disturbed they exhibit all the agility of their order in attempting to escape. No specimens of this species were found in hammocks or cultivated grounds; it is apparently confined to its littoral habitat, and it is easy to understand how it might become widely distributed on floating rubbish or driftwood. Its discovery in the West Indies and along the entire Gulf coast is, accordingly, to be expected.

Regarding the previously unknown female, it should be stated that the anal legs are slender, particularly the two distal joints. The legs are, however, pubescent, with short hairs, as in the male. The genital palpi seem to be rudimentary.

* Grandidier's Histoire, 1897, XXVII, pl. XII, figs. 8-8g. This genus is not to be confused with *Schendyloides* Attems, described as a subgenus of *Schendyla*, with which it is not related, since the mandibles are without dentate lamellæ, and the labium is tripartite, all three divisions having long teeth. *Schendyloides* is accordingly a member of the *Geophilidæ* in the strict sense.

FAMILY BALLOPHILIDÆ.

It was the occasion of considerable surprise to collect, on Sugar Loaf Key, a member of this family, as yet known only from Tropical Africa. The West African *Ballophilus clavicornis* (plate V, fig. 3) is an inhabitant of the dense forests of Liberia. It is unique among known Geophiloidea in being nearly black or deep violet in color. It now appears that this peculiarity is shared by other members of the family, undescribed forms from Venezuela and Mexico being in my possession, in addition to the specimens from the Keys. The genus *Tæniolinum* Pocock, from St. Vincent, is also probably referable to this family. These forms may be separated by means of the following synopsis:

“Antennæ very short and stout . . . their segments wider than long . . . number of pairs of legs 49”: Genus *Tæniolinum*, type *T. setosum*, St. Vincent.

Antennæ slender, more or less distinctly clavate, at least the proximal joints longer than wide; number of pairs of legs above 60.

Ventral pores in a transversely elliptical, definite area which is strongly chitinized and distinctly projects beyond the remainder of the surface; coxæ of prehensorial legs without chitinous lines: Genus *Ballophilus*, type *B. clavicornis*, Liberia.

Ventral pores in subcircular areas which are scarcely prominent; coxæ of prehensorial legs with chitinous lines.

Ventral pores in a single median area; antennæ strongly clavate: Genus *Itypophilus*, type *I. lilacinus* sp. n., Sugar Loaf Key.

Ventral pores in two areas; antennæ subfiliform: Genus *Diplethmus*, type *D. mexicanus* sp. n. (plate V, fig. 2), Mexico.

ITYPHILUS, new genus.

Closely related to *Ballophilus*, but differing in the much smaller size and more slender habit, in having the ventral pores in a small circular area, which is not definitely chitinized, and in having the coalesced coxæ of the prehensorial legs provided with chitinous sulci.

ITYPHILUS LILACINUS, new species.

(Plate V, figs. 1a-1e).

Type.—U. S. Nat. Museum, No. 777.

Locality.—Sugar Loaf Key.

Length 30 mm., width .7 mm., pairs of legs of male 71.

Color of living specimens pale brownish pink or lilac; in alcohol the color fades to a pale creamy tint.

The cephalic lamina is broader than long, but is exceeded in width by the very broad basal lamina; frontal lamina not distinct.

Coalesced coxæ of prehensors with chitinous lines, broadly emarginate in front; femur and claw unarmed.

Scuta not sulcate, the surface uneven, hirsute with long hairs; sterna also hirsute and uneven, the poriferous area distinctly prominent, but not so strongly as in *Ballophilus*.

Last sternum subtriangular, posteriorly truncate; pleuræ scarcely prominent, the two large pores concealed under the sternum; joints of anal legs very short and robust, decreasing in breadth and increasing in length distad; from the last sternum to the ends of the legs extends on each side a row of hairs larger than those which cover the adjacent parts; the last joint is conic and without a claw.

Two specimens were secured in an open area near the shore of the north side of Sugar Loaf Key.

FAMILY GEOPHILIDÆ.

Two members of this family were secured on the Keys. One is a new species evidently referable to the genus *Polycricus*, the type of which is *P. toltecus* Saussure. The second has affinities with the genus *Piestophilus* Cook, from the West Indies. The mouth-parts of *Piestophilus* are unknown, but those of the new form are so remarkable that, in addition to the other unique characters, they seem to warrant the recognition of a new subfamily, *Piestophilinæ*, to be distinguished from the *Geophilinæ* by the coalescence of all the parts of the labium except the apical joint of the labial palpus.

POLYCRICUS FLORIDANUS, new species.

(Plate IV, figs. 2a-2f).

Type.—U. S. Nat. Museum, No. 778.

Locality.—Sugar Loaf Key.

Length 55 mm., width 1.5 mm., pairs of legs of male 59, of female 61-63.

Color of alcoholic specimen rather dark, dull brownish, laterally mottled with purplish, and with rather faint indications of two parallel dorsal bands.

Cephalic lamina two-thirds as broad as long; frontal lamina coalesced; basal lamina rather narrow, the sides strongly converging.

Coalesced coxæ of the prehensors without chitinous lines, the surface moderately punctate; femur with a distinct, blunt tooth somewhat above the middle; claw armed at base with a large, blunt tooth, and denticulate along the middle of its mesial edge.

Scuta bisulcate; sterna with a large and deep median foveola which divides the transverse poriferous band.

Last sternum longer than broad; pleuræ moderately prominent, with numerous pigmental pores; anal legs unarmed, moderately crassate in the male, slender in the female.

Two specimens of this species were found in the undisturbed forest of a hammock on Sugar Loaf Key; three others were collected at Tampa.*

ERITHOPHILUS, new genus.

Body very small.

Frontal lamina coalesced; cephalic lamina not concealing the sides of the prehensors; prebasal lamina concealed and probably wanting; basal lamina broad, the sides converging cephalad.

Labrum similar to that of *Geophilus*, tripartite, the median division dentate; not sufficiently examined owing to scarcity of material.

Mandibles with a single pectinate lamella; surface of stipe pectinate; condylus not observed.

Labial sternum entire, coalesced with the basal joints of the maxillary palpi and with the interior labial processes; basal joint of maxillary palpus also coalesced with the interior labial process; distal joint of maxillary palpus small, subquadrate, simple.

Maxillary sternum broadly emarginate; maxillary palpus with basal joint broad, subconic; distal joints subequal in length and width, nearly naked; claw small and simple.

Sternum of prehensors with chitinous lines (sulci), scarcely emarginate anteriorly; prosternal teeth obsolete; basal joint of prehensors convex mesad, unarmed; claw unarmed.

Scuta scarcely convex, with two longitudinal sulci.

Spiracles round, decreasing in size caudad; spiraculiferous scutellum much smaller than the very large prescutellum, and about twice as large as the postscutellum; there is a row of three subequal middle scutella and an episternal postscutellum.

Ventral pores present, but not numerous, occurring in a definite transverse area in the posterior part of the sternum of anterior segments, where the poriferous area is not reticulated; the area and the pores become less distinct and finally obsolete caudad; the episterna are not porose.

* At Tampa I collected also a single specimen of a new genus apparently related to *Schizotænia* Cook, based on *S. prognatha*, from Liberia, in that the claw of the anal legs is replaced by a scarcely chitinized, transparent, hirsute, papilliform structure, which might be taken for a small seventh joint. The prehensorial legs also resemble those of *Schizotænia*, and the coalesced coxæ are provided with chitinous sulci, but the maxillary sternum is entire and without the peculiar processes of *Schizotænia*. The species may be known as *Tylonyx tampa*; the female has 47 pairs of legs, the last sternum is broad, and there are two pleural pores on each side.

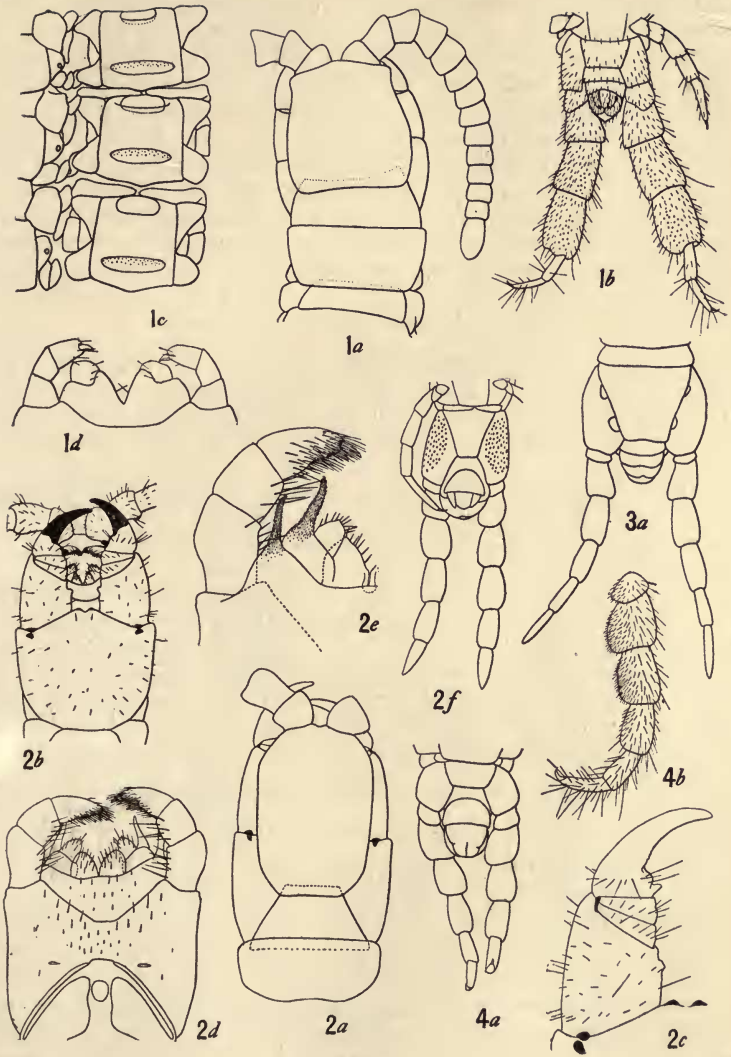


PLATE IV.

Segments 9 to 13 or 9 to 14 have, in addition to the poriferous area, a transversely elliptic depression in the anterior part of the sternum; this is strongly chitinized and clearly defined; the reticulations of the integument are distinct, but are much smaller than elsewhere.

Pleurae of last segment not inflated; provided with about ten pores opening into two cavities concealed by the last sternum, which is broader than long, with converging sides and transverse posterior margin.

Anal legs 6-jointed and provided with a claw; basal joints very large and crassate, the two distal small and slender, articulated to the superior corner of the fourth joint, against which they close; the ventro-mesial surface of the third and fourth joints have a smooth area perforated by numerous small apertures, possibly the bases of rudimentary hairs, presumably the openings of silk glands; the legs seem to be essentially alike in both sexes.

Genital palpi simple in the male, obsolete in the female.

This genus is undoubtedly closely related, if not identical, with *Piestophilus* Cook,* based on *Geophilus tenuitarsis* Pocock,† from the West Indian island Dominica. It seems, however, to deserve separation on account of the following points of difference:

Much larger size and greater number of legs, *Piestophilus tenuitarsis* being 35 mm. long and having 85 pairs of legs.

Ventral pores are present in a definite area, while wanting in *tenuitarsis*.

Pleural pores are also present, although the pleurae are smaller in proportion to the size of the anal legs than in *tenuitarsis*.

The anal legs are apparently much larger in proportion to the last segment, and have a porose area on the mesial face of the third and fourth joints; the strong lateral compression of the four proximal joints described by Pocock for *tenuitarsis* is also not pronounced in the new form.

ERITHOPHILUS NEOPUS, new species.

(Plate IV, figs. 1*a*–1*d*).

Type.—U. S. Nat. Museum, No. 779.

Locality.—Sugar Loaf Key, Florida.

Length 13 mm., width .5 mm.; number of pediferous segments varying from 45 to 47 in males to 51 in females.

Color, waxy white, the extremities brownish.

Four specimens of this species were secured by digging in the ground under stones in a recently cleared place on the north shore of Sugar Loaf Key, Florida, in March, 1898, the same station where *Ityphilus* was found.

* Proc. U. S. Nat. Mus.

† Ann. & Mag. Nat. Hist. (6) II, p. 475, pl. XVI, figs. *c-c*³ (1888).

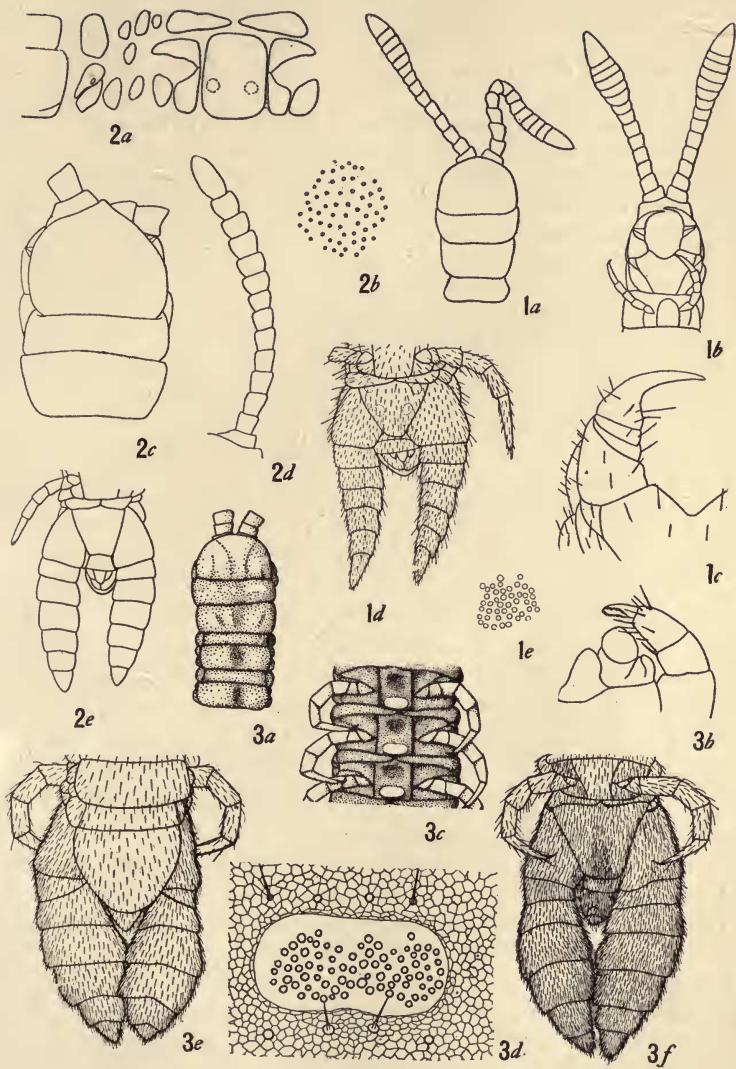


PLATE V.

EXPLANATION OF PLATES.

*Plate IV.**Erithophilus neopus.*

- Fig. 1*a*. Head, dorsal view.
 1*b*. Anal legs, ventral view.
 1*c*. Ventral and pleural sclerites of segments 10 to 12.
 1*d*. Labium and maxillæ, ventral view.

Polycricus floridanus.

- Fig. 2*a*. Head, dorsal view.
 2*b*. Same, ventral view.
 2*c*. Prehensorial leg more magnified.
 2*d*. Labium and maxillæ, ventral view.
 2*e*. Same, dorsal view, more magnified.
 2*f*. Anal segment, ventral view.

Pectiniunguis americanus.

- Fig. 3*a*. Anal segment of female, ventral view.

Holitys neomexicana.

- Fig. 4*a*. Anal segment of female, ventral view.
 4*b*. Anal leg of female, lateral view.

*Plate V.**Ityphilus lilacinus.*

- Fig. 1*a*. Head, dorsal view.
 1*b*. Same, ventral view.
 1*c*. Prehensorial leg, ventral view.
 1*d*. Anal segment, ventral view.
 1*e*. Ventral pores.

Diplethmus mexicanus.

- Fig. 2*a*. Ventral and pleural sclerites, the dotted circles showing the location of the ventral pores.
 2*b*. A cluster of ventral pores.
 2*c*. Head, dorsal view.
 2*d*. Antenna.
 2*e*. Anal segment, ventral view.

Ballophilus clavicornis.

- Fig. 3*a*. Head and first three segments, dorsal view.
 3*b*. Maxilla and half of labium, dorsal view.
 3*c*. Three segments, ventral view, showing the prominent, transversely elliptical pore-areas.
 3*d*. One of the pore-areas more magnified.
 3*e*. Anal segment, dorsal view.
 3*f*. Same, ventral view.